

Effects of Clay Manipulation on Somatic Dysfunction and Emotional Distress in Patients With Parkinson's Disease

Deborah L. Elkis-Abuhoff, Robert B. Goldblatt, Morgan Gaydos, and Samantha Corrato, Hempstead, NY

Abstract

The focus of this outcome study was on art therapy as a support for medical treatment and palliative care. A total of 41 patients were placed in 2 matched groups: 22 patients with Parkinson's disease and 19 patients without Parkinson's disease. Each participant completed the Brief Symptom Inventory (BSI) (Derogatis, 1993) pre- and post-session, and was asked to manipulate a ball of clay and to respond to follow up questions on the experience. Quantitative and qualitative results showed a positive outcome with significant decrease in somatic and emotional symptoms in both groups. This research supports the value of an art therapeutic clay program for patients diagnosed with Parkinson's disease and recommends future studies addressing art therapy with caregivers.

Literature Review

Parkinson's disease is a neurodegenerative disorder that significantly alters an individual's motor ability, mood, and overall quality of life. It was first discovered in the early 1800s by British physician James Parkinson, who characterized the disease as "shaky palsy" (Loranzo & Kalia, 2005). It is estimated today that at least four million people have been diagnosed with Parkinson's disease worldwide (Loranzo & Kalia, 2005). The disorder generally develops later in a person's life; however, the prevalence is not limited to one specific age group. Approximately 1 in 1000 people over the age of 65 are diagnosed with Parkinson's disease; it is estimated that 1 in 100 of the world population over the age of 75 is at risk for developing Parkinson's disease (Doherty & Lyle, 2004). In the past two decades, a growing number of individuals have been diagnosed with this disorder around the age of 40. (Nagayama et al., 1999). Fifteen percent of the Parkinson's disease population is diagnosed before the age of 50 (Doherty & Lyle, 2004).

Editor's note: Deborah L. Elkis-Abuhoff, PhD, ATR-BC, LCAT, is an assistant professor in the Creative Arts Therapy Program at Hofstra University in New York. Robert B. Goldblatt, PhD, is an associate professor of family medicine at the New York College of Osteopathic Medicine of New York Institute of Technology. Ms. Morgan Gaydos, MA, is affiliated with Nassau University Medical Center. Ms. Samantha Corrato, MA, is a creative arts therapy graduate of Hofstra University. Correspondence concerning this article may be addressed to the first author at cprdle@hofstra.edu

Parkinson's disease (PD) affects a person's physical movements and accelerates dopamine cell depletion. Some common symptoms include stiffness, clumsiness, and/or tremors, which can lead to difficulty walking, fatigue, depression, or limb discomfort (Lyons, Tickle-Degnen, Henry, & Cohn, 2004). The course of the disease is described as a slowing of emotional and voluntary movement, and is a combination of such symptoms as muscle rigidity, postural abnormality or instability, and tremors (Nagayama et al., 1999). Parkinson's affects the nerve cells located in the substantia nigra region of the central brain (Loranzo & Kalia, 2005). These affected cells produce dopamine, a main neurotransmitter that broadcasts signals from the brain to various muscles in the body (Gramling, 2006). Dopamine cells are a significant component of the basal ganglia, which is a circuit of the brain that coordinates movement (Loranzo & Kalia, 2005). Decreased motor ability is a result of damaged dopamine pathways; when a person's dopamine levels decrease, it becomes increasingly difficult to control muscle movements (Gramling, 2006). Symptoms are worsened by stress and generally can decrease, or even disappear with increased motor activity.

Because of these physical symptoms, individuals with PD can appear to others as lazy, anxious, or idle (Lyons et al., 2004). An individual's ability to verbally communicate is also affected by the disorder. According to Doherty and Lyle (2004), the most common changes in speech involve diminished volume, a shortened or accelerated speech pattern, and muscle rigidity resulting in tense facial muscles. Bradyphrenia, the slowness of thinking, is also linked to nerve cells damaged by PD and further adds to an individual's loss of fluent speech.

Lyons et al. (2004) found that due to physical impairments and an inability to fully communicate, individuals with Parkinson's disease tend to have a more negative personality and a decreased quality of life. Parkinson's also can foster psychiatric problems such as depression, dementia, and psychosis (Rao, Hofmann, & Shakil, 2006). Depression, a common psychiatric illness associated with PD, can further complicate a person's ability to engage in treatment effectively, as well as having a significant impact on his or her overall quality of life (Rao, et al., 2006). Simpson, Haines, Lekwuwa, Wardle and Crawford (2006) found a strong correlation between social support and depression, anxiety, and stress in the lives of individuals diagnosed with

PD. They found that a lack of treatment and social support could cause a significant increase in these patients' psychological distress. The provision of adequate social support and treatment lowered their risk for developing psychological problems by increasing positive affect, increasing their management of emotions, and promoting wellbeing.

These findings suggest that art therapy may provide potential benefits and that the use of the tactile medium of clay in particular could improve the physical and psychological effects of Parkinson's. Art therapists have documented the potential value of art therapy in medical treatment settings (Malchiodi, 1999a, 1999b, 2003; David, 1995, 2000; Wadeson, 2003). Malchiodi (1999a) posited that healing involves a process of becoming whole both physically and psychologically, and that art may function to help synthesize and integrate a patient's pain and loss. As a result, the creative process may produce positive physical changes in the body. Patients who have engaged in art therapy have demonstrated how art can bring about insights related to the experience of critical illness, as well as its contribution to overall healing and well being (Zammit, 2001). Wadeson found that for patients diagnosed with PD, creating art helped to distract them from thoughts of the disease and/or symptoms and brought about more relaxed and peaceful feelings.

Research on the effects of art therapy with Parkinson's has been limited. Tingey-Hall (1997) discussed two programs that were designed to address both the cognitive effects and movement disorders commonly found with PD. Group participants were able to express their emotions through the use of paint, which was shown to relieve stress, to calm the nervous system, and to lift depression. The creative process absorbed the participants and stimulated their imaginations, leading to a relaxed meditative state. Creating art also helped reduce the tremors associated with PD.

In some cases, an individual's artistic ability is enhanced after his or her diagnosis. Chatterjee, Hamilton, and Amorapanth (2006) studied the artwork of a patient with Parkinson's in order to understand the relationship between motor control in art and PD. It was found that the patient developed artistic expression far into his illness and was able to use art as a means to communicate and express his thoughts and emotions. Another, similar patient experienced enhanced creative ability after the initial diagnosis of PD. She stated that she needed to express herself more upon learning about her disease. Artists with PD find that art helps them not only to express their feelings about their illness but also to cope with their symptoms.

In order to further engage geriatric patients in their rehabilitation, Yaretzky, Levinson, and Kimchi (1996) investigated the use of clay as a therapeutic tool to aid patients with Parkinson's disease in gaining a new outlook on life. They found that clay manipulation was an effective sensorimotor solution in rehabilitation. This research suggest that regular sessions of art therapy using clay may decrease stress and other adverse emotional effects of PD, and potentially reduce or eliminate certain physical symptoms such as tremors and stiffness.

Method

The purpose of this study was to determine whether patients diagnosed with Parkinson's disease would be able to experience a decrease in the somatic and emotional symptoms of the disease by engaging in the manipulation of clay.

The study was conducted within a diverse treatment program sponsored by the New York College of Osteopathic Medicine of the New York Institute of Technology, for patients diagnosed with Parkinson's disease. Each patient, after initial diagnosis, is enrolled in a multi-pragmatic program that can include treatment by a medical neurologist, a psychologist, a physical therapist, and a speech/language therapist. A total of 41 participants were selected; 22 were diagnosed with PD, of which 16 were males and 6 were females, ranging in age from 56-83, with a mean age of 71.4 years. The PD group was matched with a control group of 19 participants who were not diagnosed with PD (non-PD group), comprised of 12 males and 7 females, ranging from 53-86 with a mean age of 69.7 years. The PD group's participants were recruited from the general PD patient population of the clinic's Parkinson's disease treatment program. The non-PD participants included both the caregivers of patients diagnosed with PD as well as volunteers from the general public. Participants were matched closely in regards to age and gender and were required to have dual hand usage. All subjects voluntarily agreed to enter into the study and gave a written informed consent.

The subjects first were asked to complete the Brief Symptom Inventory (BSI) (Derogatis, 1993). This 53-item psychological screening tool provides an overview of a patient's symptoms and their intensity at a specific point in time, within the week prior to completing the inventory. Items on the BSI are rated using a 5-point Likert Scale. The BSI is scored according to 9 primary symptom dimensions and 3 global indices of distress. The 9 dimensions are: Somatization (SOM), which reflects the level of distress one experiences over perceived bodily dysfunction; Obsessive-Compulsive (O-C), reflecting symptoms experienced by those suffering from this clinical disorder; Interpersonal Sensitivity (I-S), associated with feelings of personal inadequacy and inferiority, particularly in comparison with others; Depression (DEP); Anxiety (ANX); Hostility (HOS); Phobic Anxiety (PHO), defined as "a persistent fear response...that is irrational and disproportionate to the stimulus and leads to avoidance or escape behavior" (Derogatis, 1993, p. 7-9); Paranoid Ideation (PAR); and Psychoticism (PSY), which reflects a "graduated continuum [ranging] from mild interpersonal alienation to dramatic psychosis" (p. 7-9).

The 3 global indices included in the BSI are: the Global Severity Index (GSI), the Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST). The GSI is "the most sensitive single indicator of the respondent's distress level, combining information about the average level of distress" that the patient is experiencing (Derogatis, 1993, p. 31). The PSDI measures how the patient experiences distress, such as minimizing or maximizing a symptom, and the PST helps communicate

Table 1

Average T-scores Pre/Post BSI for PD Group based on a Two-tailed T-test with a significance level of .05% (N=22)

Average T-scores for PD Group	Pre- BSI (T-scores)	Post- BSI (T-scores)	Change	Significance at .05%
SOM	61.896	49.115	-12.78	S
O-C	60.657	48.032	-12.625	S
I-S	55.729	45.657	-10.07	S
DEP	59.261	47.948	-11.31	S
ANX	59.594	47.271	-12.32	S
HOS	50.375	42.865	-7.51	NS
PHO	60.553	51.375	-9.17	NS
PAR	53.094	47.625	-5.46	NS
PSY	58.604	50.667	-7.93	NS
GSI	60.844	43.303	-17.54	S
PSDI	58.157	46.386	-11.77	S
PST	59.75	43.073	-16.67	S

the extent of an individual's emotional stress when used in conjunction with the other global indices.

Following administration of the BSI, each participant in the study was presented with four balls of colored modeling clay (each about the size of a racquetball) and was asked to choose one, from a selection of red, yellow, green or blue. They were directed to squeeze the clay ball in one hand 10 times, shift it to the other hand, and again squeeze 10 times. Once the ball was manipulated in both hands, the participants were directed to pull the ball of clay into pieces. They were then asked to put the pieces together into "a shape other than a ball." Each participant had unlimited time to manipulate the clay.

After participants finished the clay manipulation they were asked the following questions:

"What made you pick the color you chose?"

"How would you describe the clay experience?"

"Can you tell me about what you have made?"

"Do you have an interest in working with clay in the future?"

Finally, participants were again administered a Brief Symptom Inventory (BSI), this time considering only their present state. Pre- and post-scores on the Brief Symptom Inventory were evaluated. Each subject's responses to the questions and the clay product itself were documented and analyzed for content and degree of expression. Researchers qualitatively analyzed each participant's responses according to the following questions: (a) Did the participant re-integrate the whole ball of clay or only a partial amount?; (b) Did the participant construct a recognizable shape?; (c) Did the clay experience trigger a measurable emotional response?; and (d) Did the participant report a future interest in working with clay?

Each participant's final clay products were photographed, and the clay was recycled into a ball for the next

Table 2

Average T-scores of Pre/Post BSI for non-PD Group based on a Two-tailed T-test with a significance level of .05% (N=19)

Average T-scores for non-PD Group	Pre- BSI (T-scores)	Post- BSI (T-scores)	Change	Significance at .05%
SOM	51.852	44.78	-7.072	NS
O-C	52.988	45.286	-7.702	NS
I-S	48.072	43.75	-4.322	NS
DEP	52.863	51.75	-1.113	NS
ANX	51.47	43.465	-8.005	NS
HOS	50.34	43.165	-7.175	NS
PHO	49.244	48.077	-1.167	NS
PAR	49.47	45.036	-4.434	NS
PSY	54.25	49.201	-5.049	NS
GSI	52.822	41.423	-11.40	S
PSDI	50.452	44.363	-6.089	NS
PST	50.929	40.451	-10.478	S

participant. Although the final product was photographed, the focus of this study was to evaluate the effects of the process rather than the product created.

Data from the pre- and post-administration of the BSI, the clay manipulation, and the qualitative interview were evaluated following completion from all participants. Data from the BSI was scored using standardized methods; participants' responses were converted into *t* scores and plotted onto a graph. Researchers compared the results of the pre- and post-BSI of each individual participant. Results of the qualitative interview and the art assessment were compared as well.

Results

Quantitative Results

Tables 1 and 2 depict the average *t* scores of the pre- and post-BSI for the 9 symptom domains. Average *t* scores for the Global Severity Index (GSI), the Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST) are included as well. A decrease in symptom severity was found across all 9 domains of the BSI for all participants diagnosed with Parkinson's disease as well as for the non-PD participants.

Tables 1 and 2 depict the average *t* score values pre- and post-session, based on a two-tailed *t* test with a significance level of .05 for both PD and non-PD group data. When comparing *t* tests of the PD group's pre- and post-BSI outcome, there is a total standard deviation of 3.16. The same comparison for the non-PD group resulted in a standard deviation of 2.61. Although both groups showed a decrease in somatic symptoms and emotional distress, the PD group showed a greater change in outcome as a result of the clay manipulation.

Table 3

Average T-scores of Pre/Post BSI for non-PD non-Caregiver Group based on a Two-tailed T-test with a significance level of .05% (N=10)

Average T-scores for non-PD non-Caregiver Group	Pre- BSI (T-scores)	Post- BSI (T-scores)	Change	Significance at .05%
SOM	52.2	46.77	-5.43	NS
O-C	57.55	46.44	-11.11	S
I-S	51.88	47.33	-4.55	NS
DEP	53.77	49.0	-4.77	NS
ANX	47.55	44.77	-2.78	NS
HOS	50.33	43.11	-7.22	NS
PHO	49.33	47.0	-2.33	NS
PAR	50.66	44.0	-6.66	NS
PSY	53.55	47.33	-6.22	NS
GSI	57.44	42.88	-14.56	S
PSDI	49.11	47.66	-1.45	NS
PST	54.0	42.44	-11.56	S

Tables 3 and 4 depict the average *t* score values pre- and post-session, based on a two-tailed *t* test with a significance level of .05 for both non-PD and non-PD caregiver group data. Because the non-PD group consisted of both caregivers and non-caregivers, a within-group *t* test was conducted. When comparing *t* tests of the non-PD/non-caregiver group there is a total standard deviation of 2.71. The same comparison for the non-PD/caregiver group resulted in a standard deviation of 3.95. Both groups showed a benefit from the clay manipulation; however, there was a greater change for the non-PD/ caregivers than for the non-PD/non-caregivers.

Qualitative Results

Whole vs. Partial Integration. All 41 participants were able to manipulate the clay in some manner. Table 5 shows the breakdown of significant qualitative factors chosen for the study. Of the 41 participants, 36 were able to reintegrate the clay upon being instructed to make a shape other than a ball. The other 5 participants demonstrated partial integration, ranging from no integration to 75 percent integration. Of the 5 participants who were unable to fully integrate the clay, 2 participants created human figures and the remaining 3 participants created figures of dogs. Two of

Table 4

Average T-scores of Pre/Post BSI for non-PD Caregiver Group based on a Two-tailed T-test with a significance level of .05% (N=9)

Average T-scores for non-PD Caregivers Group	Pre- BSI (T-scores)	Post- BSI (T-scores)	Change	Significance at .05%
SOM	50.55	43.5	-7.05	NS
O-C	48.66	43.8	-4.86	NS
I-S	40.33	41.6	+0.67	NS
DEP	51.0	45.77	-5.23	NS
ANX	48.77	42.11	-6.66	NS
HOS	49.77	43.11	-6.66	NS
PHO	49.0	53.55	+4.55	NS
PAR	46.55	45.11	-1.44	NS
PSY	52.7	50.0	-2.7	NS
GSI	48.3	40.0	-8.3	NS
PSDI	49.77	41.2	-8.77	NS
PST	48.1	35.3	-13.1	S

the participants diagnosed with PD experienced frustration during the clay manipulation; this response may have had an effect on the ability to reintegrate the clay as a whole. The other 3 participants experienced no frustration and chose not to fully integrate the pieces.

Recognizable Shape. Of the 41 participants, 30 manipulated the clay into a recognizable shape. The other 11 participants were unable to form a recognizable shape but they were able to identify their creation as a person or an object. The most common recognizable shapes (Table 6) included: animals (10 participants; Figure 1), human figures (6 participants; Figure 2), circles/shapes (9 participants; Figure 3), boats/planes (4 participants; Figure 4), and free form shapes (4 participants; Figure 5).

Emotional Response. There was a strong link between forming a recognizable shape and having an emotional response to the clay manipulation. Of the 30 participants who created a recognizable shape, 28 participants had an emotional response. The majority of participants who had an emotional response related the experience to family members and/or childhood experiences. Some participants, however, had specific responses, such as loving nature or engaging in personal hobbies. The majority of participants who did not experience an emotional response to the clay manipulation also found it frustrating and not enjoyable.

Table 5

Research Group	Whole Integration	Partial Integration	Recognizable Shape	Emotional Response	Future Interest	Color Blue	Color Red	Color Yellow	Color Green
Non-PD Male (12)	10	2	7	6	8	8	2	1	1
Non-PD Female (7)	6	1	7	7	5	2	2	2	1
PD-Male (16)	14	2	12	12	10	4	4	8	0
PD-Female (6)	6	0	4	3	6	3	2	1	0



Figure 1
Sample Shape: Animal



Figure 2
Sample Shape: Human Figure



Figure 3
Sample Shape: Circle/Shapes



Figure 4
Sample Shape: Boats/Planes



Figure 5
Sample Shape: Free Form

Future Interest. Of the 41 participants in this study, 29 expressed a future interest in working with clay. Of the male and female participants diagnosed with PD, 16 of the 22 stated that they would like to work with clay in the future. All of the female participants in the PD group expressed an interest in future work with clay, and 10 of the 16 male participants in the PD group expressed an interest. This does not mean, however, that the other male participants did not enjoy the experience. Three of the 6 participants who did not report a future interest in clay stated that the experience was fun and enjoyable.

Color Choice. The majority of the male participants in the PD group chose to work with yellow clay. All of these participants stated that they chose yellow because it was the brightest, most cheerful color to select. Of the 8 participants, 3 stated that they chose yellow to brighten up their mood.

The majority (17) of the total 41 participants in the study chose the blue clay as their color preference. Fourteen of those 17 participants stated that blue was their favorite color. Among males in the Non-PD group, blue was the most common choice; 8 of the 12 males chose to work with this color over the other color choices. Fifty percent (3 out of 6) of the females with PD chose to work with the blue clay; the other half selected red and yellow with no particular reason stated.

Among females in the non-PD group, the color selection varied with no specific color chosen over another. The green clay was the least chosen color: only two of the 41 participants chose to work with green clay. One participant stated that she chose green because she intended to create an evergreen, an appropriate color choice. The other participant chose green because it was his favorite color. A few par-

Table 6

Research Group	Animals	Human Figures	Circles/Shape	Boats/Plane	Free Form
Non-PD Male (12)	3	2	4	1	1
Non-PD Female (7)	1	1	3	0	1
PD Male (16)	5	2	1	1	2
PD Female (6)	1	1	1	2	0

ticipants stated that besides the yellow, the rest of the colors were dark and not as vibrant. Because the hue of the green was a darker shade compared to the other colors, it may be assumed that it was less appealing to the participants.

Discussion

When comparing the pre- and post-BSI outcomes and the qualitative data for PD and non-PD groups, it is evident that both groups benefited from the clay experience. Based on the results of the BSI evaluation, the PD group had a greater decrease in scores than the control group; however, the control group also had a decrease in their pre- and post-BSI scores.

The non-PD group consisted of both caregivers and non-caregivers, so it was interesting to explore the within group differences. The outcome recorded on the BSI for the non-caregivers group showed a positive response to the clay manipulation. However, based on the significantly higher standard deviation from pre-to post- on the BSI, it is apparent that the caregivers had a stronger reaction to the clay manipulation. This difference between non-caregivers and caregivers shows that the non-PD outcome was affected by the inclusion of caregivers. Because being a caregiver is a stressful role, it is not surprising that the caregivers' outcome was similar to that of patients diagnosed with PD.

The clay medium chosen for this research was modeling dough. After exploring a variety of clay media, the researchers determined that modeling dough would give the participant the best opportunity for manipulation. Most people relate the smell and texture of modeling dough to childhood. Therefore, it was considered an unusual experience for working with adults and proved to be the appropriate choice for those participants diagnosed with Parkinson's disease. Because modeling clay is soft and becomes increasingly softer with manipulation, the incorporation of squeezing the clay in each hand at the beginning played a dual role. The process helped each participant to become familiar and engaged with the clay medium at the same time that it increased the pliability of the clay. Some participants reported that it was a chance to return to younger years and childhood. The modeling dough gave these participants permission to play, whereas others connected the clay to special times spent with grandchildren.

Because the nature of the clay medium lends itself best to manipulation with both hands, dual hand usage was a criterion for those who participated. Our hypothesis was that for those diagnosed with PD engaging in the clay medium would decrease emotional stress and somatic symptoms. We also were aware that the clay medium could be frustrating for those unable to easily manipulate it with both hands. Given prior research that showed that the act of grasping and engaging in art therapy may have positive outcomes for those with PD, such as a decrease in tremors, it was logical to use clay for those who met our criterion of dual hand usage. Individuals with PD-related tremors who use the grasping motion, as opposed to the fine motor skill of holding a pencil or paintbrush, may experience a reduction in their tremors. Because the goal was to help relieve

emotional distress and somatic symptoms, clay was the best choice to achieve this outcome. This finding is supported by the significant decrease in BSI symptoms in Table 1.

This study had positive results that support the use of clay manipulation in decreasing somatic symptoms and emotional distress for those diagnosed with Parkinson's disease. One limitation regarding these results could be related to the Hawthorne effect. Because each participant worked closely with the researcher with respect to the qualitative methods used, there may have been a need for the participant to please the researcher with positive reporting. However, because the BSI was administered both before and after the clay experience, and is also a quantitative measurement, the significantly positive outcome can be considered more reliable, as it supports the qualitative interview.

Included in the study was a choice of four different colored balls of clay. This option was added to explore whether there would be trend of preferred color choices among PD participants as compared to non-PD participants. No specific color choice could be identified between groups. However, when participants were asked why they chose their color, they usually related it to personal choice. Some participants reported that the color was bright and cheerful, whereas others simply stated that it was one of their favorite colors. As a result, each participant chose a color that he or she connected to and felt positive about. Because each participant has an individual color preference, there was not a defined color trend.

It is interesting to note that even when participants stated that they did not enjoy the experience, and would not choose to do this type of activity in the future, they were still able to report a positive emotional response during the qualitative interview. Many participants recalled memories of favorite activities they used to enjoy in their younger days, such as sailing or gardening. Other participants remembered their grandchildren, pets, and present-day interests. This led to discussions about how they can still have involvement in such activities even if the involvement is from a different angle. Some participants reported that they originally felt like children when presented with the clay medium, but after the manipulation experience many reported that the clay was fun and enjoyable. Some said that it was good to do an activity that brought them back to their younger years.

After the clay manipulation experience was completed and photographed, each participant was asked if it was okay for us to recycle the clay. All participants agreed to allow their creation to be recycled back into the original ball shape. As part of this process, the researcher would ask the participant if he or she wanted to recreate the ball shape. In most cases the participant would voluntarily take the clay creation and return it to the original ball shape.

Future Considerations

Engagement in an art therapeutic experience, such as a clay project, may bring about a measurable change in physiological state such as a decrease in blood pressure.

However, because most of our participants came to us directly from physical therapy and exercising, we were not able to accurately monitor a change in resting heart rate through recording blood pressure.

Because this study included both patients diagnosed with Parkinson's disease and participants who did not have a diagnosis of PD, many of our control group participants were caregivers. This came about because most patients diagnosed with PD are accompanied to the clinic by a caregiver, who in most cases was a significant other. One of the outcomes of this research was the realization that there is a considerable need for an art therapy program that addresses the emotional and psychosocial needs of caregivers. Many of these participants had a significant decreases in emotional distress and somatic symptoms that were similar to the PD participant group.

This conclusion is supported by how engaged the caregivers became in the clay manipulation experience, as well as by the outcome of the pre- and post-BSI. As one woman, who had been extremely agitated when agreeing to participate, started to engage in the clay experiential, her persona softened considerably. When asked about her experience, she first apologized for being so difficult, then stated that the experience had relaxed her and helped her to realize that as a caregiver she had become hardened. She explained that the clay experience brought "balance" back into her life, and she believed that both she and her husband would benefit from a program such as art therapy.

In conclusion, the results of this study indicate a positive effect for individuals who are asked to manipulate clay as an art therapeutic intervention. There was a decrease in somatic dysfunction and emotional distress in both the patients diagnosed with Parkinson's disease and those who were not, which confirms the research hypothesis. Furthermore, it was found that the caregivers of those diagnosed with Parkinson's disease also had an increase in somatic functioning and a decrease in emotional distress. This research supports the value of an art therapeutic clay program for patients diagnosed with Parkinson's disease and encourages future studies addressing art therapy with caregivers.

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